



(11) **EP 1 795 185 A3**

(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:  
**27.06.2007 Bulletin 2007/26**

(51) Int Cl.:  
**A61K 9/16** <sup>(2006.01)</sup> **A61K 9/51** <sup>(2006.01)</sup>  
**A61K 9/00** <sup>(2006.01)</sup>

(43) Date of publication A2:  
**13.06.2007 Bulletin 2007/24**

(21) Application number: **06256206.1**

(22) Date of filing: **06.12.2006**

(84) Designated Contracting States:  
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR  
HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI  
SK TR**  
Designated Extension States:  
**AL BA HR MK YU**

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(30) Priority: **07.12.2005 US 296101**

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(54) **Nano- and/or micro-particulate formulations for local injection-based treatment of vascular diseases**

(57) The present invention relates to nano- and/or micro-particulate formulations that can be locally injected into arterial walls at or near target sites to achieve a prolonged and sufficiently high local concentration of at least one pharmacologically active agent for treatment of vascular diseases, such as, for example, restenosis, vulnerable plaque, aneurysm, and stroke. Specifically, each formulation comprises biocompatible and biodegradable nano-particles and/or micro-particles loaded with the pharmacologically active agent and d-alpha-tocopheryl

polyethylene glycol 1000 succinate (vitamin E TPGS). The formulations can be formed by a solvent evaporation/extraction process or a supercritical CO<sub>2</sub> extraction process that uses vitamin E TPGS as an emulsifier. Further, vitamin E TPGS can be used as a stabilizer for the pharmacologically active agent in the final drug formulation, as well as a release modulation to control release of the pharmacologically active agent.

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| DOCUMENTS CONSIDERED TO BE RELEVANT  |   |   |  |
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| Category   | Citation of document with indication, where appropriate, of relevant passages   | Relevant to claim                               | CLASSIFICATION OF THE APPLICATION (IPC)  |
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| The present search report has been drawn up for all claims   |   |   |  |
| Place of search<br>The Hague   |   | Date of completion of the search<br>21 May 2007 | Examiner<br>Boulois, Denis               |
| CATEGORY OF CITED DOCUMENTS<br>X : particularly relevant if taken alone<br>Y : particularly relevant if combined with another document of the same category<br>A : technological background<br>O : non-written disclosure<br>P : intermediate document<br>T : theory or principle underlying the invention<br>E : earlier patent document, but published on, or after the filing date<br>D : document cited in the application<br>L : document cited for other reasons<br>& : member of the same patent family, corresponding document |   |   |  |

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EPO FORM 1508 03/82 (P04C01)



| DOCUMENTS CONSIDERED TO BE RELEVANT  |  |   |   |
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| The present search report has been drawn up for all claims   |  |   |   |
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| Category   | Citation of document with indication, where appropriate, of relevant passages   | Relevant to claim   | CLASSIFICATION OF THE APPLICATION (IPC) |
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| The present search report has been drawn up for all claims   |   |   | TECHNICAL FIELDS SEARCHED (IPC)         |
| Place of search<br>The Hague   |   | Date of completion of the search<br>21 May 2007   | Examiner<br>Boulois, Denis              |
| CATEGORY OF CITED DOCUMENTS<br>X : particularly relevant if taken alone<br>Y : particularly relevant if combined with another document of the same category<br>A : technological background<br>O : non-written disclosure<br>P : intermediate document |   | T : theory or principle underlying the invention<br>E : earlier patent document, but published on, or after the filing date<br>D : document cited in the application<br>L : document cited for other reasons<br>.....<br>& : member of the same patent family, corresponding document |   |

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**CLAIMS INCURRING FEES**

The present European patent application comprised at the time of filing more than ten claims.

- Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claim(s):
- No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

**LACK OF UNITY OF INVENTION**

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

- All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
- As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.
- Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:
- None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:



The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-14(partially), 15(entirely), 17-21 ( partially)

Nanoparticles with an active agent efficacious for treating vascular diseases wherein the formulation comprises d-alpha-tocopheryl polyethylene glycol 1000 succinate at a concentration of 0.01 wt% to 20 wt%.

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2. claims: claims 1-14 ( partially ), 16 ( entirely ), 17-21 ( partially )

Microparticles with an active agent efficacious for treating vascular diseases wherein the formulation comprises d-alpha-tocopheryl polyethylene glycol 1000 succinate at a concentration of 0.01 wt% to 20 wt%.

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**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 06 25 6206

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on  
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

21-05-2007

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